## Claims

We claim:

1. Apparatus comprising an optical fibre having a waveguide and at least one stress applying region: in which the waveguide is defined by a numerical aperture; the stress applying region has a depressed refractive index; the optical fibre is configured such that the waveguide supports at least two polarised fundamental modes, two polarised first second-order modes, and two polarised second second-order modes; the waveguide comprises a gain medium; and the stress applying region, the waveguide and the disposition of the gain medium are such as to provide preferential guidance to at least one of the modes at an operating wavelength.

2. Apparatus according to claim 1 in which the optical fibre is bent.

3. Apparatus according to claim 1 or claim 2 in which the gain medium comprises one or more rare-earth dopants.

4. Apparatus according to claim 3 in which the rare earth dopant comprises one or more of Ytterbium, Erbium, Neodymium, Praseodymium, Thulium, Samarium, Holmium, Europium, Terbium, and Dysprosium.

5. Apparatus according to any one of the preceding claims in which at least one of the fundamental modes, the first second-order modes, and the second second-order modes is leaky at the operating wavelength.

6. Apparatus according to any one of the preceding claims in which the optical fibre is configured to operate as a single-polarisation optical fibre at the operating wavelength.

7. Apparatus according to any one of the preceding claims in which the optical fibre is tapered along its length.

8. Apparatus according to any one of the preceding claims in which the waveguide is tapered along its length.

9. Apparatus according to any one of the preceding claims in which the numerical aperture corresponds to an index difference less than 0.0035.

10. Apparatus according to any one of claims 1 to 8 in which the numerical aperture may correspond to an index difference less than 0.003.

11. Apparatus according to any one of claims 1 to 8 in which the numerical aperture may correspond to an index difference less than 0.0025.

12. Apparatus according to any one of claims 1 to 8 in which the numerical aperture may correspond to an index difference less than 0.002.

13. Apparatus according to any one of the preceding claims in which the optical fibre comprises a photosensitive region.

14. Apparatus according to claim 13 in which the photosensitive region is at least partly in the stress applying region.

15. Apparatus according to claim 13 in which the photosensitive region is at least partly in the waveguide.

16. Apparatus according to any one of the preceding claims in which the optical fibre is defined by a stimulated Brillouin scattering threshold, and the optical fibre has been exposed to ultraviolet radiation at least partly along its length in order to increase the stimulated Brillouin scattering threshold.

17. Apparatus according to any one of the preceding claims in which the optical fibre is defined by a stimulated Brillouin scattering threshold, and the optical fibre has been exposed to heat treatment at least partly along its length in order to increase the stimulated Brillouin scattering threshold.

18. Apparatus according to any one of the preceding claims and in the form of an optical amplifying device.

19. Apparatus according to claim in which the optical amplifying device provides single-polarisation operation.

20. Apparatus according to claim 18 or claim 19 in which the optical amplifying device is an optical amplifier, a laser, a master oscillator power amplifier, or a source of amplified spontaneous emission.